IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend claims 1-2, 8, 10-12, 18, 20-21, 31 and 41 as follows:

1. (Currently Amended) A multiplexing apparatus which multiplexes a plurality of audio elementary data streams and a plurality of video elementary data stream to generate one multiplexed stream, the multiplexing apparatus comprising:

encoders receiving video date from a video source, receiving audio data from an audio source, encoding the video data into the video elementary data streams, encoding the audio data into the audio elementary data streams, dividing the video elementary data streams into a plurality of video data units and dividing the audio elementary streams into a plurality of audio data units;

a memory which stores [[a]] the plurality of video and audio data units that are composed of an arbitrary amount of said video and audio elementary data streams;

an instruction generating means for calculating an order of multiplexing the video data units and the audio data units based on storage location supplied by the encoder, for generating a plurality of multiplexing instruction data which describe the storage location and order of multiplexing of each data unit and for storing the multiplexing instruction data into the memory in an order that said plurality of video and audio data units are to be multiplexed; and

a multiplexed stream generating means for generating one multiplexed stream by reading the multiplexing instruction data and data units sequentially from the memory and for outputting the data unit corresponding to the multiplexing instruction data.

2. (Currently Amended) A multiplexing apparatus which multiplexes a plurality of

video elementary data streams and a plurality of audio elementary data streams to generate one multiplexed stream, the multiplexing apparatus comprising:

encoders receiving video date from a video source, receiving audio data from an audio source, encoding the video data into the video elementary data streams, encoding the audio data into the audio elementary data streams, dividing the video elementary data streams into a plurality of video data units and dividing the audio elementary streams into a plurality of audio data units;

a memory which stores [[a]] the plurality of video and audio data units that are composed of an arbitrary amount of said video and audio elementary data streams;

an instruction generating means for calculating an order of multiplexing the video data units and audio data units based on storage location supplied by the encoders, generating a plurality of multiplexing instruction data which describe the storage location and order of multiplexing of each data unit while generating command instruction data having stated therein an instruction for execution of a data processing to be executed in an arbitrary position in the multiplexing instruction data, and storing the multiplexing instruction data and command instruction data into the memory in an order that the plurality of video and audio data units and execution instruction are to be multiplexed;

a multiplexed stream generating means for generating one multiplexed stream including the video and audio elementary data streams and command data by reading the multiplexing instruction data, data units and command instruction data sequentially from the memory and outputting the data unit corresponding to the multiplexing instruction data, after reading the multiplexing instruction data, or by outputting command data having stated therein the execution

instruction stated in the command instruction data, after reading the command instruction data; and

a command executing means which is supplied with a multiplexed stream output from the multiplexed stream generating means and makes a processing corresponding to an instruction content stated in the command data when a data row in the multiplexed stream is command data, or outputs the multiplexed stream as it is when the data row in the input multiplexed stream is video and audio elementary data stream.

3. (Previously Presented) The apparatus as set forth in claim 2, wherein:

the multiplexed stream generating means outputs, synchronously with the multiplexed stream, an ID flag for identifying which data row in the multiplexed stream is command data or elementary data stream; and

the command executing means judges based on the ID flag whether the data row in the multiplexed stream is command data or elementary data stream.

4. (Previously Presented) The apparatus as set forth in claim 2, wherein:

the instruction generating means generates, when inserting stuffing data into an output multiplexed stream, command instruction data having stated therein an instruction for inserting the stuffing data and an amount of the stuffing data;

the multiplexed stream generating means outputs, when the command instruction data has stated therein an instruction for inserting the stuffing data, the command data having stated therein the content stated in the command instruction data; and

the command executing means inserts, when the command data has stated therein an instruction for inserting the stuffing data, stuffing data whose amount is stated in the command data to a position of the command data in the multiplexed stream.

5. (Previously Presented) The apparatus as set forth in claim 2, wherein:

the instruction generating means generates, when deleting data from an output multiplexed stream, command instruction data having stated therein a data delete instruction and data amount to be deleted;

the multiplexed stream generating means outputs, when the command instruction data has stated therein an instruction for deletion of data, the command data having stated therein the content stated in the command instruction data; and

the command executing means deletes, when the command data has stated therein an instruction for deletion of the data, an amount of data stated in the command data from a multiplexed stream next to the command data.

6. (Previously Presented) The apparatus as set forth in claim 2, wherein:

the instruction generating means generates, when inserting arbitrary data into an output multiplexed stream, command instruction data having stated therein an instruction for insertion of the arbitrary data;

the multiplexed stream generating means outputs, when the command instruction data has stated therein an instruction for insertion of the arbitrary data, the command data having stated therein the content stated in the command instruction data; and

the command executing means inserts, when the command data has stated therein an instruction for insertion of the arbitrary data, the arbitrary data stated in the command data to a position of the command data in the multiplexed stream.

7. (Previously Presented) The apparatus as set forth in claim 2, wherein:

the instruction generating means generates, when sending a timing acknowledgment in an arbitrary timing in an output multiplexed stream, command instruction data having stated therein an instruction for sending a timing acknowledgment;

the multiplexed stream generating means outputs, when the command instruction data has stated therein an instruction for sending the timing acknowledgment, the command data having stated therein the content stated in the command instruction data; and

the command executing means sends, when the command data has stated therein an instruction for sending the timing acknowledgment, the timing acknowledgment in a position of the command data in the multiplexed stream.

8. (Currently Amended) A multiplexing apparatus which multiplexes a plurality of video elementary data streams and a plurality of audio elementary data streams to generate one multiplexed stream, the multiplexing apparatus comprising:

encoders receiving video date from a video source, receiving audio data from an audio source, encoding the video data into the video elementary data streams, encoding the audio data into the audio elementary data streams, dividing the video elementary data streams into a plurality of video data units and dividing the audio elementary streams into a plurality of audio data units;

a memory which stores [[a]] the plurality of video and audio data units that are composed of an arbitrary amount of said video and audio elementary data streams;

a counting means for indicating a count which indicates a data occupancy of the memory;

an instruction generating means for calculating an order of multiplexing the video data units and audio data units based on storage location supplied by the encoders, generating a plurality of multiplexing instruction data which describe the storage location and order of multiplexing of each data unit and storing the multiplexing instruction data into the memory in an order that said plurality of video and audio data units are to be multiplexed; and

a multiplexed stream generating means for generating one multiplexed stream by reading the multiplexing instruction data and data units sequentially from the memory and outputting the data unit corresponding to the multiplexing instruction data;

the instruction generating means adding a data amount of a data unit corresponding to the multiplexing instruction data to the count; and

the counting means subtracting the data amount of output data unit from the count.

9. (Previously Presented) The apparatus as set forth in claim 8, wherein:

the memory is divided into a plurality of storage areas correspondingly to the types of the elementary data streams and the elementary data streams is stored into corresponding storage areas;

the counting means holds a plurality of counts corresponding to the storage areas in the memory;

the instruction generating means adds the data amount of a data unit corresponding to the multiplexing instruction data to a count corresponding to a storage area in which the data unit is stored; and

the counting means subtracts the data amount of data unit output from the memory from a count corresponding to the storage area in which the data unit is stored.

10. (Currently Amended) A multiplexing apparatus which multiplexes a plurality of video elementary data streams and a plurality of audio elementary data streams to generate a plurality of multiplexed streams, the multiplexing apparatus comprising:

encoders receiving video date from a video source, receiving audio data from an audio source, encoding the video data into the video elementary data streams, encoding the audio data into the audio elementary data streams, dividing the video elementary data streams into a plurality of video data units and dividing the audio elementary streams into a plurality of audio data units;

a memory which stores [[a]] the plurality of video and audio data units that are composed of arbitrary amounts of said video and audio elementary data streams;

an instruction generating means for calculating an order of multiplexing the video data units and audio data units based on storage location supplied by the encoders, generating a plurality of multiplexing instruction data which describe the storage location and order of multiplexing of each data unit and storing the multiplexing instruction data into the memory in an order that said plurality of video and audio data units are to be multiplexed; and

a multiplexed stream generating means for generating a plurality of multiplexed streams by reading the multiplexing instruction data and data units sequentially from the memory, and outputting the data unit corresponding to the multiplexed instruction data;

the instruction generating means stating, in the multiplexing instruction data, the type of a multiplexed stream resulted from multiplexing data units corresponding to the generated multiplexing instruction data; and

the multiplexed stream generating means generating the plurality of multiplexed streams by switching the outputting of the data unit read correspondingly to the multiplexed stream type stated in the multiplexing instruction data.

11. (Currently Amended) A multiplexing method in which a plurality of video elementary data streams and a plurality of audio elementary streams are multiplexed to generate one multiplexed stream, the multiplexing method comprising the steps of:

receiving video data from a video source, receiving audio data from an audio source, encoding the video data into the plurality of video elementary data streams, encoding the audio data into the ~~supplying a~~ plurality of audio elementary data streams, dividing each said elementary data streams into a plurality of data units that are composed of an arbitrary amount of said elementary data stream and storing said data units into a memory;

calculating an order of multiplexing [[the]] video data units and audio data units based on storage location, generating multiplexing instruction data which describe the storage location and order of multiplexing of each said data unit and storing the multiplexing instruction data into the memory in an order that said plurality of video and audio data units are to be multiplexed; and

generating a multiplexed stream by reading the multiplexing instruction data and data units sequentially from the memory and outputting the data unit corresponding to the multiplexing instruction data.

12. (Currently Amended) A multiplexing method in which a plurality of video elementary data streams and a plurality of audio elementary data streams are multiplexed to generate one multiplexed stream, the multiplexing method comprising the steps of:

receiving video data from a video source, receiving audio data from an audio source, encoding the video data into the plurality of video elementary data streams, encoding the audio data into the ~~supplying a~~ plurality of audio elementary data streams, dividing [[the]] each elementary data streams into a plurality of data units that are composed of an arbitrary amount of the elementary data stream and storing said data units into a memory;

calculating an order of multiplexing [[the]] video data units and audio data units based on storage location, generating multiplexing instruction data which describe the storage location and order of multiplexing of each said data unit while generating command instruction data having stated therein an instruction for execution of a data processing to be executed in an arbitrary position in the multiplexing instruction data, and storing the multiplexing instruction data and command instruction data into the memory in an order that said video and audio data units and execution instruction are to be multiplexed;

generating a multiplexed stream including the video and audio elementary data streams and command data by reading the multiplexing instruction data, the data units and command instruction data sequentially from the memory and outputting the data unit corresponding to the multiplexing instruction data, after reading the multiplexing instruction data, or by outputting

command data having stated therein the execution instruction stated in the command instruction data, after reading the command instruction data; and

being supplied with a multiplexed stream output from the multiplexed stream generating means and making a processing corresponding to an instruction content stated in the command data when a data row in the multiplexed stream is command data, or outputting the multiplexed stream as it is when the data row in the multiplexed stream is video and audio elementary data stream.

13. (Previously Presented) The method as set forth in claim 12, further comprising the steps of:

synchronously outputting an ID flag, for identifying which data row in the multiplexed stream is command data or elementary data stream, with the multiplexed stream; and

determining based on the ID flag whether the data row in the multiplexed stream is command data or elementary data stream.

14. (Previously Presented) The method as set forth in claim 12, [[wherein]] further comprising the steps of:

when inserting stuffing data into an output multiplexed stream, generating command instruction data having stated therein an instruction for inserting the stuffing data and an amount of the stuffing data;

when the command instruction data has stated therein an instruction for inserting the stuffing data, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for inserting the stuffing data, inserting stuffing data whose amount is stated in the command data into a position of the command data in the multiplexed stream.

15. (Previously Presented) The method as set forth in claim 12, further comprising the steps of:

when deleting data from an output multiplexed stream, generating command instruction data having stated therein a data delete instruction and data amount to be deleted;

when the command instruction data has stated therein an instruction for deletion of data, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for deletion of the data, deleting an amount of data stated in the command data from a multiplexed stream next to the command data.

16. (Previously Presented) The method as set forth in claim 12, further comprising the steps of:

when inserting arbitrary data into an output multiplexed stream, generating command instruction data having stated therein an instruction for insertion of the arbitrary data;

when the command instruction data has stated therein an instruction for insertion of the arbitrary data, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for insertion of the arbitrary data, inserting the arbitrary data stated in the command data into a position of the command data in the multiplexed stream.

17. (Previously Presented) The method as set forth in claim 12, further comprising the steps of:

when sending a timing acknowledgment in an arbitrary timing in an output multiplexed stream, generating command instruction data having stated therein an instruction for sending a timing acknowledgment;

when the command instruction data has stated therein an instruction for sending the timing acknowledgment, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for sending the timing acknowledgment, sending the timing acknowledgment in a position of the command data in the multiplexed stream.

18. (Currently Amended) A multiplexing method in which a plurality of video elementary data streams and a plurality of audio elementary data streams are multiplexed to generate one multiplexed stream, the multiplexing method comprising the steps of:

receiving video data from a video source, receiving audio data from an audio source, encoding the video data into the plurality of video elementary data streams, encoding the audio data into the ~~supplying a~~ plurality of audio elementary data streams, dividing [[the]] each

elementary data streams into a plurality of data units that are composed of an arbitrary amount of the elementary data stream and storing the data units into a memory;

calculating an order of multiplexing [[the]] video data units and audio data units based on storage location, generating multiplexing instruction data which describe the storage location and order of multiplexing of each said data unit and storing the multiplexing instruction data into the memory in an order that the plurality of video and audio data units are to be multiplexed; and

generating a multiplexed stream by reading the multiplexing instruction data and data units sequentially from the memory and outputting the data unit corresponding to the multiplexing instruction data;

in the instruction generating step, adding the data amount of a data unit corresponding to the multiplexing instruction data to a count in a counter indicating data occupancy of the memory; and

subtracting the data amount of data unit output from the memory from the count.

19. (Previously Presented) The method as set forth in claim 18, further comprising the steps of:

dividing the memory in a plurality of storage areas correspondingly to the types of the elementary data streams and storing the supplied elementary data streams into corresponding storage areas;

holding a plurality of counts corresponding to the storage areas in the memory in the counter;

adding the data amount of a data unit corresponding to the multiplexing instruction data to a count corresponding to a storage area in which the data unit is stored; and

subtracting the data amount of data unit output from the memory from a count corresponding to the storage area in which the data unit is stored.

20. (Currently Amended) A multiplexing method in which a plurality of video elementary data streams and a plurality of audio elementary data streams are multiplexed to generate a plurality of multiplexed streams, the multiplexing method comprising the steps of:

receiving video data from a video source, receiving audio data from an audio source, encoding the video data into the plurality of video elementary data streams, encoding the audio data into the ~~supplying a~~ plurality of audio elementary data streams, dividing [[the]] each elementary data streams into a plurality of data units that are composed of an arbitrary amount of the elementary data stream and storing the data units into a memory;

calculating an order of multiplexing [[the]] video data units and audio data units based on storage location, generating multiplexing instruction data which describe the storage location and order of multiplexing of each said data unit and storing the multiplexing instruction data into the memory in an order that the plurality of video and audio data units are to be multiplexed;

stating, in the multiplexing instruction data, the type of a multiplexed stream resulted from multiplexing data units corresponding to the multiplexing instruction data; and

generating a plurality of multiplexed streams by reading the multiplexing instruction data and data units sequentially from the memory and outputting the data unit corresponding to the multiplexing instruction data and switching the outputting of the data unit correspondingly to the multiplexed stream type stated in the multiplexing instruction data.

21. (Currently Amended) A multiplexer for multiplexing a plurality of video elementary data streams and a plurality of audio elementary data streams to generate a multiplexed stream, the multiplexer comprising:

a bus;

encoders receiving video date from a video source, receiving audio data from an audio source, encoding the video data into the video elementary data streams, encoding the audio data into the audio elementary data streams, dividing the video elementary data streams into a plurality of video data units and dividing the audio elementary streams into a plurality of audio data units;

a data memory storing the plurality of video and audio elementary data streams;

an instruction memory storing multiplexing instruction data;

a direct memory access (DMA) circuit for connection to the bus for directly accessing the plurality of video and audio elementary data streams stored in the data memory and ~~multiplexing~~ accessing the multiplexing instruction data stored in the instruction memory, wherein [[the]] each video and audio elementary data streams [[are]] is stored as data units in the data memory, and the multiplexing instruction data state ~~the~~ location of data units in the data memory in an order of multiplexing the corresponding data units;

wherein the multiplexer is operable to generate a multiplexed stream by reading multiplexing instruction data sequentially with said DMA circuit from the instruction memory, by reading data units sequentially from storage locations stated in the read multiplexing instruction data, and by outputting the read data units as said multiplexed stream.

22. (Previously Presented) The multiplexer of claim 21, wherein the multiplexing instruction data includes command instruction data having stated therein an instruction for data processing to be executed in an arbitrary position in the multiplexing instruction data, and the multiplexer is further operable to output command data having stated therein the instruction stated in the command instruction data, when having read the command instruction data;

the multiplexer further including a command executing means which is supplied with the generated multiplexed stream and which performs processing corresponding to an instruction stated in the command data when the data in the input multiplexed stream is command data, or outputs the input multiplexed stream as it is when the data in the input multiplexed stream is elementary data stream.

23. (Previously Presented) The multiplexer of claim 22, wherein:

the multiplexer outputs, synchronously with the multiplexed stream supplied to the command executing means, an ID flag for identifying if the data in the multiplexed stream is command data or elementary data stream; and

the command executing means determines based on the ID flag, if the data in the supplied multiplexed stream is command data or elementary data stream.

24. (Previously Presented) The multiplexer of claim 22, wherein:

when the command instruction data has stated therein an instruction for inserting stuffing data and amount of the stuffing data, wherein the generated multiplexed stream outputs command data having stated therein the content stated in the command instruction data, the command executing means inserts, when the command data has stated therein an instruction for

inserting the stuffing data, stuffing data whose amount is stated in the command data to a position of the command data in the multiplexed stream.

25. (Previously Presented) The multiplexer of claim 22, wherein:

when the command instruction data has stated therein a data delete instruction and data amount to be deleted, the generated multiplexed stream outputs command data having stated therein the content stated in the command instruction data, and the command executing means deletes, when the command data has stated therein an instruction for deletion of the data, an amount of data stated in the command data from a multiplexed stream next to the command data.

26. (Previously Presented) The multiplexer of claim 22, wherein:

when the command instruction data has stated therein an instruction for insertion of the arbitrary data, the generated multiplexed stream means outputs the command data having stated therein the content stated in the command instruction data, and the command executing means inserts, when the command data has stated therein an instruction for insertion of the arbitrary data, the arbitrary data stated in the command data to a position of the command data in the multiplexed stream.

27. (Previously Presented) The multiplexer of claim 22, wherein:

when the command instruction data has stated therein an instruction for sending a timing acknowledgement, the generated multiplexed stream means outputs the command data having stated therein the content stated in the command instruction data, and the command executing

means sends, when the command data has stated therein an instruction for sending the timing acknowledgement, the timing acknowledgement in a position of the command data in the multiplexed stream.

28. (Previously Presented) The multiplexer according to claim 21, further comprises:

a counting means for indicating a count which indicates a data occupancy of the data memory;

wherein the data amount of a data unit corresponding to the multiplexing instruction data is added to the count; and

the counting means is operable to subtract the data amount of output data unit from the count.

29. (Previously Presented) The multiplexer of claim 28, wherein:

the data memory is divided into a plurality of storage areas corresponding to the types of the elementary data streams and the supplied elementary data streams are stored into corresponding storage areas;

the counting means holds a plurality of counts corresponding to the storage areas in the data memory;

the data amount of a data unit corresponding to the multiplexing instruction data is added to a count corresponding to a storage area in which the data unit is stored; and

the counting means subtracts the data amount of data unit output from the data memory from a count corresponding to the storage area in which the data unit is stored.

30. (Previously Presented) The multiplexer according to claim 21, wherein:

the multiplexer is operable to generate a plurality of multiplexed streams by reading the multiplexing instruction data from the instruction memory, by reading the data units sequentially from the storage locations stated in the read multiplexing instruction data, and by outputting the read data units;

the multiplexing instruction data states the type of a multiplexed stream resulted from multiplexing data units corresponding to the multiplexing instruction data; and

the multiplexer is operable to generate the plurality of multiplexed streams by switching the outputting of the read data unit corresponding to the multiplexed stream type stated in the read multiplexing instruction data,

31. (Currently Amended) An apparatus for multiplexing a plurality of video elementary data streams and a plurality of audio elementary data streams to generate a multiplexed stream, the apparatus comprising:

a bus;

encoders receiving video date from a video source, receiving audio data from an audio source, encoding the video data into the video elementary data streams, encoding the audio data into the audio elementary data streams, dividing the video elementary data streams into a

plurality of video data units and dividing the audio elementary streams into a plurality of audio data units;

a data memory linked to the bus;

an instruction memory linked to the bus;

a CPU linked to the bus for generating multiplexing instruction data having stated therein a storage location in the data memory of a data unit formed from an elementary stream and for storing the generated multiplexing instruction data into the instruction memory in an order corresponding to the multiplexing of the data units; and

a multiplexer for multiplexing [[a]] the plurality of video elementary data streams and the plurality of audio elementary data stream to generate a multiplexed stream, the multiplexer comprising:

a direct memory access (DMA) circuit for connection to the bus for directly accessing the plurality of video and audio elementary data streams stored in the data memory and ~~multiplexing~~ accessing instruction data stored in the instruction memory, wherein [[the]] each video and audio elementary data streams [[are]] is stored as data units in the data memory, and the multiplexing instruction data state the storage location of data units in the data memory in an order of multiplexing the corresponding data units;

wherein the multiplexer is operable to generate a multiplexed stream by reading multiplexing instruction data sequentially with said DMA circuit from the instruction memory, by reading data units sequentially from storage locations stated in the read multiplexing instruction data, and by outputting the read data units as said multiplexed stream, and

wherein the direct memory access (DMA) circuit is connected to said bus for directly accessing the plurality of video and audio elementary data streams stored in the data memory and directly accessing the multiplexing instruction data stored in the instruction memory.

32. (Previously Presented) The apparatus of claim 31, wherein:

the CPU generates multiplexing instruction data and command instruction data having stated therein an instruction for data processing to be executed in an arbitrary position in the multiplexing instruction data, and stores the generated multiplexing instruction data and command instruction data into the instruction memory in an order corresponding to the multiplexing of the data units and execution instruction;

the multiplexer generates a multiplexed stream including the elementary data streams and command data by reading the multiplexing instruction data and command instruction data sequentially from the instruction memory, reading the data units sequentially from the storage locations stated in the read multiplexing instruction data and outputting the read data units, when having read the multiplexing instruction data, or outputting command data having stated therein the execution instruction stated in the command instruction data, when having read the command instruction data; and

the apparatus further including a command executing means which is supplied with the multiplexed stream and performs processing corresponding to an instruction content stated in the command data when the data row in the input multiplexed stream is command data, or outputs the input multiplexed stream as it is when the data row in the input multiplexed stream is elementary data stream.

33. (Previously Presented) The apparatus of claim 32, wherein:

the multiplexer outputs, synchronously with the multiplexed stream, an ID flag for identifying if the data in the multiplexed stream is command data or elementary data stream; and

the command executing means determines, based on the ID flag, if the data in the supplied multiplexed stream is command data or elementary data stream.

34. (Previously Presented) The apparatus of claim 32, wherein:

the CPU generates, when inserting stuffing data into an output multiplexed stream, command instruction data having stated therein an instruction for inserting the stuffing data and amount of the stuffing data;

the multiplexer outputs, when the read command instruction data has stated therein an instruction for inserting the stuffing data, the command data having stated therein the content stated in the command instruction data; and

the command executing means inserts, when the command data has stated therein an instruction for inserting the stuffing data, stuffing data whose amount is stated in the command data to a position of the command data in the multiplexed stream.

35. (Previously Presented) The apparatus of claim 32, wherein:

the CPU generates, when deleting data from an output multiplexed stream, command instruction data having stated therein a data delete instruction and data amount to be deleted;

the multiplexer outputs, when the read command instruction data has stated therein an instruction for deletion of data, the command data having stated therein the content stated in the command instruction data; and

the command executing means deletes, when the command data has stated therein an instruction for deletion of the data, an amount of data stated in the command data from a multiplexed stream next to the command data.

36. (Previously Presented) The apparatus of claim 32, wherein:

the CPU generates, when inserting arbitrary data into an output multiplexed stream, command instruction data having stated therein an instruction for insertion of the arbitrary data;

the multiplexer outputs, when the read command instruction data has stated therein an instruction for insertion of the arbitrary data, the command data having stated therein the content stated in the command instruction data; and

the command executing means inserts, when the command data has stated therein an instruction for insertion of the arbitrary data, the arbitrary data stated in the command data to a position of the command data in the multiplexed stream.

37. (Previously Presented) The apparatus of claim 32, wherein:

the CPU generates, when sending a timing acknowledgement in an arbitrary timing in an output multiplexed stream, command instruction data having stated therein an instruction for sending a timing acknowledgement;

the multiplexer outputs, when the read command instruction data has stated therein an instruction for sending the timing acknowledgement, the command data having stated therein the content stated in the command instruction data; and

the command executing means sends, when the command data has stated therein an instruction for sending the timing acknowledgement, the timing acknowledgement in a position of the command data in the multiplexed stream.

38. (Previously Presented) The apparatus according to claim 31, further comprising:

a counting means in the multiplexer for indicating a count which indicates a data occupancy of the memory;

wherein the CPU adds the data amount of a data unit corresponding to the generated multiplexing instruction data to the count; and

wherein the counting means subtracts the data amount of output data unit from the count.

39. (Previously Presented) The apparatus of claim 38, wherein:

the data memory is divided in a plurality of storage areas corresponding to the types of the elementary data streams and the supplied elementary data streams are stored into corresponding storage areas;

the counting means holds a plurality of counts corresponding to the storage areas in the data memory;

the CPU adds the data amount of a data unit corresponding to the generated multiplexing instruction data to a count corresponding to a storage area in which the data unit is stored; and

the counting means subtracts the data amount of data unit output from the data memory from a count corresponding to the storage area in which the data unit is stored.

40. (Previously Presented) The apparatus according to claim 31, wherein:

the multiplexer generates a plurality of multiplexed streams by reading the multiplexing instruction data sequentially from the instruction memory, reading the data units sequentially from the storage locations stated in the read multiplexing instruction data and by outputting the read data units;

the CPU states, in the multiplexing instruction data, the type of a multiplexed stream resulted from multiplexing data units corresponding to the generated multiplexing instruction data; and

the multiplexer generates the plurality of multiplexed streams by switching the outputting of the read data unit according to the multiplexed stream type stated in the read multiplexing instruction data.

41. (Currently Amended) A method for multiplexing a plurality of video elementary data streams and a plurality of audio elementary data streams to generate a multiplexed stream, the method comprising the steps of:

receiving video data from a video source, receiving audio data from an audio source, encoding the video data into the plurality of video elementary data streams, encoding the audio

data into the plurality of audio elementary data streams, and storing [[a]] the plurality of video and audio elementary data streams in a data memory;

generating multiplexing instruction data having stated therein a storage location in the data memory of a data unit formed from an elementary stream and for storing the generated multiplexing instruction data into an instruction memory in an order corresponding to the multiplexing of the data units;

using a direct memory access (DMA) circuit in a multiplexer for directly accessing the plurality of elementary data streams stored in the data memory and the multiplexing instruction data stored in the instruction memory; and

generating a multiplexed stream in the multiplexer by reading multiplexing instruction data sequentially with said DMA circuit from the instruction memory, by reading data units sequentially from storage locations stated in the read multiplexing instruction data, and by outputting the read data units as said multiplexed stream.

42. (Previously Presented) The method of claim 41, further comprising the steps of:

generating command instruction data having stated therein an instruction for execution of a data processing to be executed in an arbitrary position in the multiplexing instruction data, and storing the generated multiplexing instruction data and command instruction data into the instruction memory in an order of multiplexing data units and execution instruction;

generating one multiplexed stream including the elementary data streams and command data by reading the multiplexing instruction data and command instruction data sequentially from the memory, reading the data units sequentially from the storage locations stated in the read

multiplexing instruction data and outputting the read data units, when having read the multiplexing instruction data, or outputting command data having stated therein the execution instruction stated in the command instruction data, when having read the command instruction data; and

processing the multiplexed stream according to an instruction content stated in the command data when the data in the multiplexed stream is command data, or outputting the multiplexed stream as it is when the data in the multiplexed stream is elementary data stream.

43. (Previously Presented) The method of claim 42, wherein:

an ID flag for identifying if the data in the multiplexed stream is command data or elementary data stream is provided synchronously with the multiplexed stream; and

determining based on the ID flag if the data in the multiplexed stream is command data or elementary data stream.

44. (Previously Presented) The method of claim 42, wherein:

when inserting stuffing data into the multiplexed stream, there is generated command instruction data having stated therein an instruction for inserting the stuffing data and amount of the stuffing data;

when the read command instruction data has stated therein an instruction for inserting the stuffing data, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for inserting the stuffing data, inserting, stuffing data, whose amount is stated in the command data, at the position of the command data in the multiplexed stream.

45. (Previously Presented) The method of claim 42, wherein:

when deleting data from the multiplexed stream, generating command instruction data having stated therein a data delete instruction and data amount to be deleted;

when the read command instruction data has stated therein an instruction for deletion of data, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for deletion of the data, deleting an amount of data, stated in the command data, from the multiplexed stream next to the command data.

46. (Previously Presented) The method of claim 42, wherein:

when inserting arbitrary data into the multiplexed stream, generating command instruction data having stated therein an instruction for insertion of the arbitrary data;

when the read command instruction data has stated therein an instruction for insertion of the arbitrary data, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for insertion of the arbitrary data, inserting the arbitrary data stated in the command data to a position of the command data in the multiplexed stream.

47. (Previously Presented) The method of claim 42, wherein:

when sending a timing acknowledgement in an arbitrary timing in the multiplexed stream, generating command instruction data having stated therein an instruction for sending a timing acknowledgement;

when the read command instruction data has stated therein an instruction for sending the timing acknowledgement, outputting the command data having stated therein the content stated in the command instruction data; and

when the command data has stated therein an instruction for sending the timing acknowledgement, sending the timing acknowledgement in a position of the command data in the multiplexed stream.

48. (Previously Presented) The method according to claim 41, further comprising the steps of:

adding the data amount of a data unit corresponding to the generated multiplexing instruction data to a count in a counter indicating data occupancy of the data memory; and

subtracting the data amount of data unit output from the data memory from the count.

49. (Previously Presented) The method of claim 48, wherein:

dividing the data memory in a plurality of storage areas corresponding to the types of the elementary data streams and storing the supplied elementary data streams into corresponding storage areas;

holding a plurality of counts corresponding to the storage areas in the data memory;

adding the data amount of a data unit corresponding to the generated multiplexing instruction data to a count corresponding to a storage area in which the data unit is stored; and

subtracting the data amount of data unit output from the data memory from a count corresponding to the storage area in which the data unit is stored.

50. (Previously Presented) The method according to claim 41, further comprising the steps of:

stating, in the multiplexing instruction data, the type of a multiplexed stream resulted from multiplexing data units corresponding to the generated multiplexing instruction data; and

generating a plurality of multiplexed streams by reading the multiplexing instruction data sequentially from the instruction memory, reading the data units sequentially from the storage locations stated in the read multiplexing instruction data, and by outputting the read data units and by switching the outputting of the read data units according to the multiplexed stream type stated in the read multiplexing instruction data.